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ABSTRACT

Using the generative model of learning, this study investigates the effects of reader constructed text headings on readers' text recall and comprehension. One hundred pupils, ages 12-14, from the Blythe Bridge Comprehensive School, Staffordshire, England, were assigned to one of two treatment groups using a 1000-word passage. The experimental group students generated their own headings while headings were provided for the control group. Both immediate and one week delayed posttests, plus the Keele Reading Test, were administered. Results indicated no group differences in reading ability, immediate heading and fact recall, or delayed passage structure recall (matching test). The control group performed better on the delayed headings recall and the delayed arrangement recall. The experimental group performed better on the delayed recall inference test which suggests some higher level of understanding consistent with the generative hypotheses. Sex differences are also noted. (BS)

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The Effects of Learner-Generated
versus
Experimenter-Provided Headings
on
Immediate and Delayed Recall
and
Comprehension

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INTRODUCTION

Previous studies in this series (Hartley & Trueman, 1983) have focused on several attributes and effects of embedding headings in text, including

- * recall, retrieval, and searching (from familiar and unfamiliar text)
- * the position of headings (marginal vs. text embedded)
- * the form of headings used (questions vs. statements)
- * the ability level of the readers.

Generally, headings have proved effective for facilitating recall, search, and retrieval of information from text. The position of headings does not seem to affect performance, and neither does the form (except for some slight advantages for question headings with lower ability learners).

In this study, we explored readers' processing of the information in the text and the information contained in the headings. Is there a processing advantage in having readers supply their own headings? Specifically, we are concerned with whether or not reader constructed headings will make information more meaningful

and therefore more memorable than when readers simply process headings provided in the text. According to the generative model of learning (Wittrock, 1978), when learners actively relate information presented in the text to prior knowledge (an activity presumably involved in constructing headings), they comprehend it better. When learners are given training and instructions to generate their own questions about the main ideas in text, for instance, their comprehension scores improve (Andre & Anderson, 1978/79). Since generating headings requires summarizing skills similar to generating questions, it is reasonable to suppose that producing headings may also improve passage comprehension. The argument runs, if learners generate their own elaborations for text rather than relying on those provided by the author, recall should improve. Elaborating is a learning strategy which requires learners to "add to that which is being learned" (Gagne, et al, 1984). In elaborating on text, learners assign meaning to a passage by providing their own context for comprehension. The addition of information in headings also provides additional, relevant retrieval cues. Writing sentences from memory about each paragraph, for instance, has aided comprehension of 10-12-year-olds (Doctorow, et al, 1978), and writing headings produced greater recall of text structure, and thus subordinate information, in college students (DeeLucas & DiVesta, 1983). So, it is reasonable to expect that generating headings should

significantly affect recall of passage structure, that is, the higher level information which organizes the information presented in the passage.

METHOD

Participants

Four classes, consisting of 100 pupils, aged 12-14, from the Blythe Bridge Comprehensive School, Staffordshire, were drawn from the upper form and randomly assigned to one of two groups. There was no difference in the reading comprehension ability of the two groups, as measured by the Keele Reading Test.

Passage

Adapted from the Sunday Observer Magazine, the passage was 3 1/2 pages (approximately 1000 words), typed in one and a half spacing on A4 paper with a line length of 16 cms. The passage reported the results of a survey on television viewing habits in the United Kingdom. The content was slightly altered to accommodate changes in the broadcast industry since the article was originally written. The passage, used in numerous previous experiments, consisted of 12 paragraphs with a heading for every two paragraphs. In the experimental passage, a blank was inserted

in place of the headings. Instructions to the students were presented on a cover sheet.

Measurement: Immediate Posttest

- * Recall of headings - blank lines on a sheet of paper with instructions to recall the headings presented in the passage (recall of passage structure).

- * Recall of facts - 12 item short answer test, used in previous experiments (Hartley & Trueman, 1983), querying factual content not found in the headings (factual recall).

Measurement: Delayed Posttest

- * Recall of headings - same as above

- * Arrangement test - the list of headings contained in the passage presented in random order with instructions to determine the correct order (recall of passage structure).

- * Matching test - 15 matching items in which

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participants were required to properly subsume paraphrased excerpts from the passage under the correct passage heading (recall of passage structure).

* Summarizing test - 8 multiple-choice items paraphrasing the meaning of selected passage information (comprehension).

* Inference test - 7 multiple choice items requiring inferences from information presented in the passage.

Procedure

The four classes were randomly assigned to one of two treatment groups, one in which students generated their own headings (experimental) and one in which headings were provided in the passage (control). A read-only control group (no headings) was not employed because the effectiveness of the provided headings in this passage had been verified in 12 previous studies, so the headings-provided passage functioned as a control for purposes of comparison. Treatment for each group was conducted on separate days in a lecture hall in order to facilitate the giving and comprehension of the instructions and procedures. A practice passage of

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similar length and difficulty on a unrelated topic (the life of Louis Braille) was first presented to each group. In the experimental passage, the first two headings were provided, with the participants practicing constructing the final four. Following questions and clarification, participants read the criterion passage at their own pace and completed the immediate posttest. One week after reading the passage, the delayed posttests were administered, followed by the Keele Reading Test (Hartley, Trueman, & Pigram, 1983), a cloze-type test of reading comprehension.

RESULTS

Ability data

No difference between groups on reading ability, but girls ($M=50.36$) were superior to boys ($M=48.19$), $F=5.79$, $p<.02$.

Immediate recall of headings

No main effects resulted, however boys in the experimental group ($M=5.50$) and girls in the control

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group ($M=5.44$) performed better, $F=7.67, p<.006$.

Immediate recall of facts

No treatment effects, but boys ($M=7.52$) perform better than girls ($M=6.71$), $F=6.58, p<.02$, especially in the experimental group (N.S.).

Delayed recall of headings

A main effect for treatment indicated that the control group ($M=4.13$) outperformed the experimental group ($M=2.89$), $F=14.68, p<.001$. A significant interaction showed that experimental boys ($M=3.13$) performed better than experimental girls ($M=2.66$), while control girls ($M=4.96$) outperformed control group boys ($M=3.30$), $F=10.84, p<.001$.

Arrangement test

The control group performed substantially better ($M=4.68$) than the generated headings group ($M=2.58$), $F=33.73, p<.001$.

Matching test

No significant differences between groups ($M(\text{control})=9.65$, $M(\text{experimental})=9.16$).

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Summarizing test

Boys ($M=5.50$) comprehended more than girls ($M=4.80$), $F=4.68, p<.03$. Girls in the experimental group ($M=4.24$) did significantly worse, $F=4.84, p<.03$.

Inference test

A treatment effect indicated that the experimental group ($M=3.82$) was able to infer more from the passage than the control group ($M=3.23$), $F=5.43, p<.02$. Also, girls ($M=3.90$) performed significantly better than the boys ($M=3.15$), $F=9.06, p<.005$. The interaction was not significant.

CONCLUSIONS

1) The groups were matched in ability, but girls, as is generally the case, did better than boys on the reading test. The data was re-analyzed using an ANCOVA procedure with verbal ability as the covariate, but the results were not affected.

2) No major differences occurred on the immediate test.

Boys performed slightly better than girls on these tasks. Since neither test was a true measure of comprehension and since generative effects are usually more obvious in retention score, this is not surprising.

3) The headings-provided group performed better on the headings recall, arrangement, and matching (N.S.) tests because the directions and the task were oriented to the headings that were provided. The directions have been re-written in a replication of this study. Also, comprehension and recall of passage structure, it appears, can be accurately assessed only with a free recall type of measure. The results do suggest that readers who saw the headings were more likely to use this information when asked to do something with it.

4) Comprehension of passage information was assessed by the summarizing and inference tests. No significant differences occurred in the summarizing test (though the boys in the generated-headings group outperformed all the others). Provided headings produced as high a level of comprehension (as measured by the summarizing test) as having readers summarize passage information.

The superior ability of readers who generated their headings to infer from the passage information, however, suggests some higher level understanding. This is certainly consistent with the generative hypothesis. In any replication studies, this area of measurement needs to be expanded. The necessity of free-recall measures is also obvious. The equivalent levels of performance on most of the measures may also be attributed to the higher level of experiential knowledge that learners possess about the topic -- television -- prior to reading the passage. These limitations have been addressed in a replication study recently completed.

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